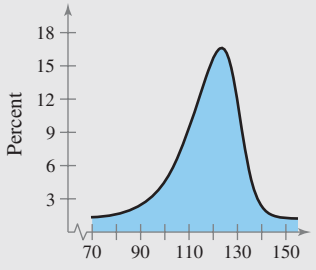
WHERE YOU'VE BEEN

In Chapters 1 through 4, you learned how to collect and describe data, find the probability of an event, and analyze discrete probability distributions. You also learned that if a sample is used to make inferences about a population, then it is critical that the sample not be biased. Suppose, for instance, that you wanted to determine the rate of clinical mastitis (infections caused by bacteria that can alter milk production) in dairy herds. How would you organize the study? When the Animal Health Service performed this study, it used random sampling and then classified the results according to breed, housing, hygiene, health, milking management, and milking machine. One conclusion from the study was that herds with Red and White cows as the predominant breed had a higher rate of clinical mastitis than herds with Holstein-Friesian cows as the main breed.

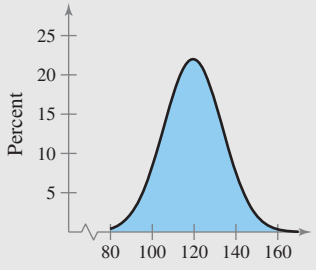
WHERE YOU'RE GOING

In Chapter 5, you will learn how to recognize normal (bell-shaped) distributions and how to use their properties in real-life applications. Suppose that you worked for the North Carolina Zoo and were collecting data about various physical traits of Eastern Box Turtles at the zoo. Which of the following would you expect to have bell-shaped, symmetric distributions: carapace (top shell) length, plastral (bottom shell) length, carapace width, plastral width, weight, total length? For instance, the four graphs below show the carapace length and plastral length of male and female Eastern Box Turtles in the North Carolina Zoo. Notice that the male Eastern Box Turtle carapace length distribution is bell-shaped, but the other three distributions are skewed left.

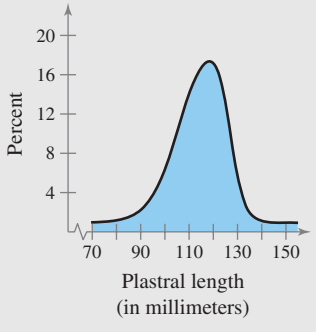
Female Eastern Box Turtle Carapace Length



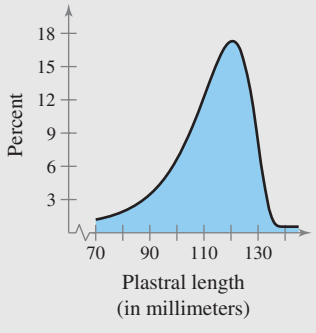
Male Eastern Box Turtle Carapace Length



Female Eastern Box Turtle Plastral Length

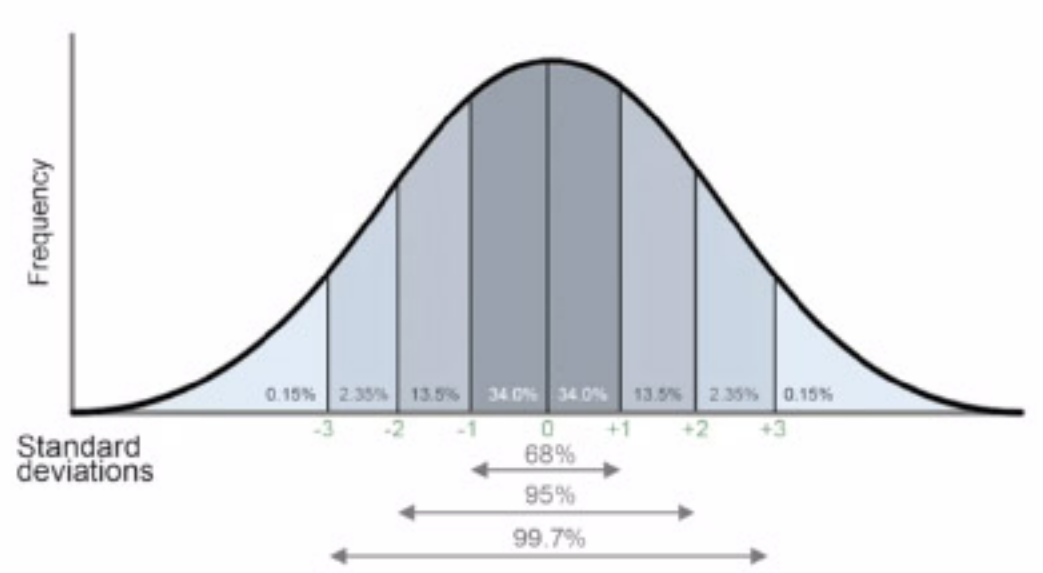


Male Eastern Box Turtle Plastral Length



Dr. A's T. U. S. K.

Things Dr. Anglin Says U Should Know



Name _____

Worksheet **Date _____ Period _____**

1. The lifetimes of 10,000 watch batteries are normally distributed. The mean lifetime is 500 days. The standard deviation is 60 days. Sketch a normal curve that represents this distribution; label the mean and 3 standard deviations.

Estimate how many watch batteries will last for each of the following intervals.

a.) 440 – 560 days

b.) 380 – 620 days

c.) 320 – 680 days

d.) 410-590 days? (In addition to your answer, also write down what you have to enter into your calculator.)

2. A group of students weighs 500 US pennies. They find that the pennies have normally distributed weights with a mean of 3.1g and a standard deviation of 0.14g

a) What percentage of pennies will weigh between 2.8 and 3.3g?

b) What percentage of pennies will weigh between 2.11 and 3.5g?

c.) What percentage of pennies will weigh less than 2.96g?

d.) What percentage of pennies will weigh more than 3.4g?

3. A set of 1000 values has a normal distribution. The mean of the data is 120, and the standard deviation is 20.

a) What percent of the data is in the range 110 to 130?

b) What percent of the data is in the range 90 to 110?

c) How many values are within the limits 100 and 150?

d) How many values are greater than 140?

e) How many values are within one standard deviation from the mean?

4. Suppose the heights of adult men are normally distributed. The heights of a sample of 30 men are shown below in inches.

61	66	67	68	72	75
65	67	67	69	72	76
65	67	68	69	72	78
65	67	68	71	73	83
65	67	68	71	73	85

a) Compute the mean and standard deviation of the sample.

b) Draw a normal curve that represents the distribution of adult male height based on the sample.

5. On the blank normal curve, label the percentages, mean, and standard deviations that are associated with it.